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United States Patent [19]

Levy

[11] **Patent Number:** **5,163,765**[45] **Date of Patent:** **Nov. 17, 1992**[54] **COLLAPSIBLE KEYBOARD**[75] **Inventor:** David H. Levy, Santa Clara, Calif.[73] **Assignee:** Apple Computer, Inc., Cupertino, Calif.[21] **Appl. No.:** 846,188[22] **Filed:** Mar. 4, 1992[51] **Int. Cl.⁵** B41J 5/16; B41J 5/12[52] **U.S. Cl.** 400/492; 400/472;
200/5 A; 235/145 R[58] **Field of Search** 400/492, 490, 493, 495,
400/472; 200/5 R, 5 A, 515, 514, 513, 512;
235/145 R[56] **References Cited****U.S. PATENT DOCUMENTS**

3,699,294	10/1972	Sudduth	200/5 A
3,940,758	2/1976	Margolin	200/5 A
4,302,648	11/1981	Sago et al.	200/515
4,492,829	1/1985	Rodrique	200/5 A
4,536,625	8/1985	Bebie	200/5 A
4,710,597	12/1987	Loheac	235/145 R
4,800,243	1/1989	Osawa et al.	200/514
4,950,874	8/1990	Damitio et al.	400/472
4,952,761	8/1990	Viebrantz	200/513
5,044,798	9/1991	Roylance et al.	400/472

FOREIGN PATENT DOCUMENTS

2586117	2/1987	France	235/145 R
8200064	1/1982	PCT Int'l Appl.	235/145 R

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A collapsible keyboard for use with portable personal computers is disclosed. A first preferred embodiment of the present invention comprises a keyboard molded from a conductive, elastomeric material and a collapsible frame/circuit board substrate, the substrate having a plurality of electrical contacts to indicate to the computer when a key is pressed. As the keyboard is formed from an elastic material, it can be compressed into a first, closed position of minimum size to facilitate carrying the computer and to minimize the computer's size. In the keyboard's second, expanded position, each of the molded keys overlies a pair of contacts. When a key is pressed while the keyboard is in this second position, an electrical circuit is formed by the key and the contacts, indicating to the computer both that a key has been pressed and which key has been pressed. In another embodiment of the present invention, two pairs of contacts underlie each key, one pair being used when the keyboard is in its first position and the other pair being used when the keyboard is in its second position.

5 Claims, 1 Drawing Sheet